COMMERCIAL BANK DATA SYSTEMS MARKETS

INPUT

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ANALYSIS OF COMMERCIAL BANK DATA SYSTEMS MARKETS

Prepared For:
CITIBANK

NOVEMBER 1978

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ANALYSIS OF COMMERCIAL BANK DATA SYSTEMS MARKETS

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I INTRODUCTION

I INTRODUCTION

- This report evaluates the CITITRAN bank information processing system and analyzes the potential for its entry into the marketplace, particularly in the area of correspondent bank data processing.

- The scope of the study was finalized at CITIBANK on October 11, 1978.

- The information and forecasts contained in this report were obtained from a synthesis of current INPUT data from the following sources:

  - "Computer Services Markets In Correspondent Banking" (MAS Industry Report No. 13)

  - "Distributed Data Processing Systems: Applications, Performance, and Architecture" (Impact Report #10).

  - "IBM Series/1, User Attitudes, Peripheral Opportunities, Product Plans And Competitive Impact" (Multiclient Study)

  - "Personal Trust Computer Service" (Custom Study)

  - "MICR Item Processing Systems" (Custom Study)

  - EDP User Panel Questionnaire (30 banks)

  - Small Establishment Survey (33 banks)

- The objectives of the study were:

  - To forecast the market size for the CITITRAN system.

  - To assess the competitive environment with respect to:

    - Hardware vendors.

    - Commercial banks offering correspondent data processing.

    - Computer services vendors offering correspondent data processing.

  - To forecast potential market share.

  - To outline the principal marketing and technical requirements for market entry.

  - To analyze alternative marketing strategies for successful market entry.

- The analyses and recommendations contained herein represent INPUT's best judgement based on the data and the time available for this study.

II EXECUTIVE SUMMARY

II EXECUTIVE SUMMARY

A. SUMMARY OF RESULTS

- The market for CITITRAN is small to medium-size banks whose deposits range from $10 million to $300 million.

- CITITRAN is most competitive for those small and medium-size banks who currently use outside data processing services.

- In 1979, CITITRAN could be marketed to approximately 6,500 banks which have, on average, two branches. By 1983, the potential number of applicable banks will increase to nearly 7,900.

- The 1979 market potential for the CITITRAN system in current dollars is $780 million (Exhibit II-1). This potential will rise to $1.2 billion by 1983 for an average annual growth rate (AAGR) of 12%. The forecasted potential growth is based on two components: (1) the growth of the number of applicable banks and branches; and (2) an allowance for inflation of 6%.

- A conservative forecast (Exhibit II-1) of CITITRAN market share is $40 million (5% of market potential) in 1979, rising to $180 million (15% of market potential) by 1983 for an AAGR of 36%.

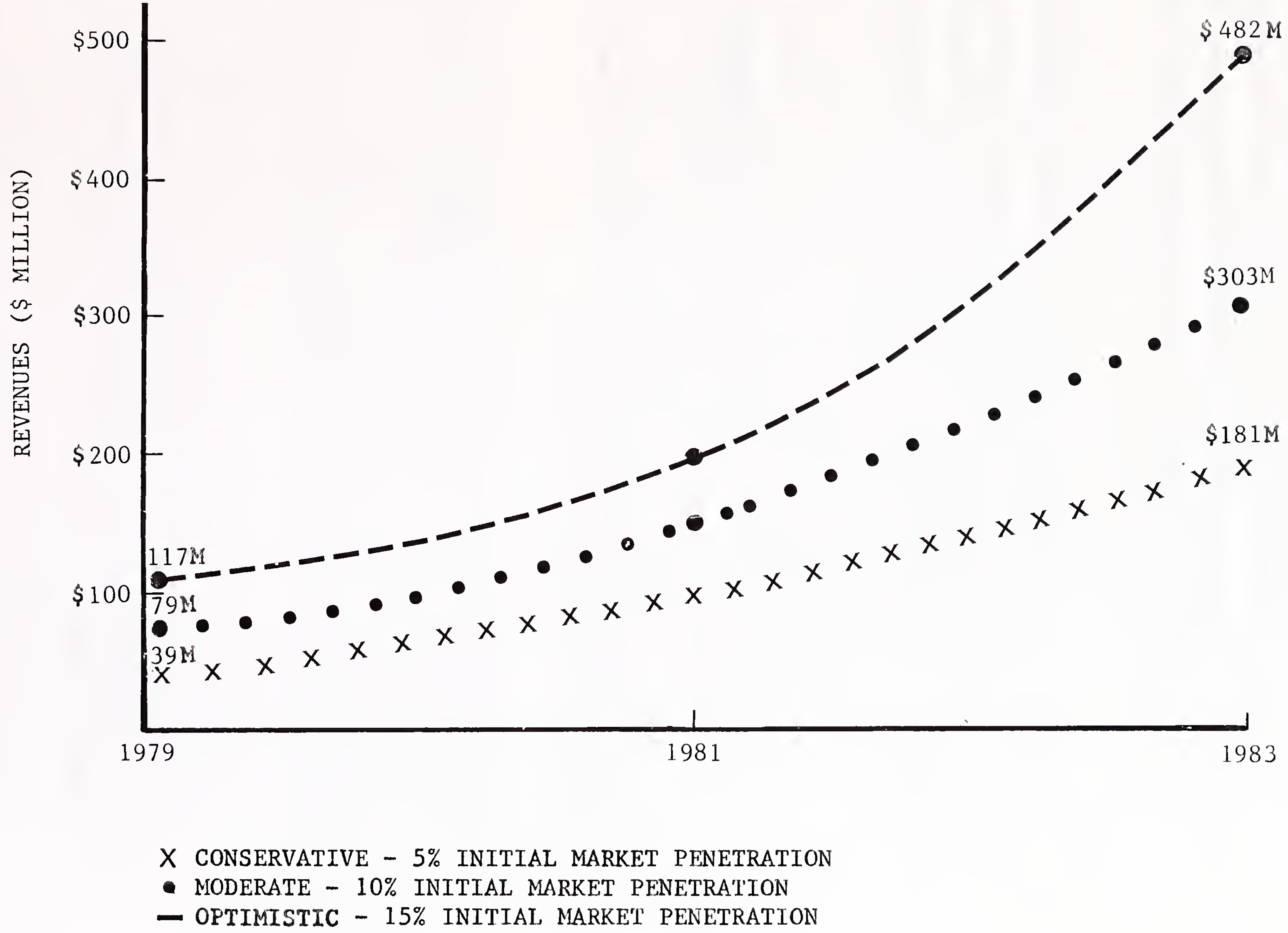
EXHIBIT II-1

FORECAST OF MARKET POTENTIAL (DOLLARS) FOR CITITRAN SYSTEM, 1979-1983

BANK DEPOSIT SIZE	1979				1983				
	NUMBER OF BANKS	CITITRAN AVERAGE COST PER YEAR ($000)	MARKET POTENTIAL ($M)	NUMBER OF BANKS	AAGR (%)	CITITRAN AVERAGE COST PER YEAR ($000)	AAGR (%)	MARKET POTENTIAL ($M)	AAGR (%)
MEDIUM $100-300M	161	$437	$ 70	210	7%	$552	6%	$ 116	13.4%
SMALL $50-100M	993	248	246	1206	5	313	6	377	11.3
$25-50M	1878	132	248	2292	5	167	6	383	11.5
$10-25M	3426	63	216	4167	5	80	6	333	11.4
TOTAL	6458	--	$780	7875	5%	--	6%	$1209	11.6%

EXHIBIT II-2

FORECAST OF PENETRATION OF CITITRAN SYSTEMS INTO COMMERCIAL BANKING MARKETPLACE, 1979-1983



- The conservative forecast implies that in 1979 CITITRAN will be successfully marketed to over 300 banks, and that over 900 branch and main office configurations will be delivered representing a capital investment of over $100 million. The number of banks on CITITRAN could grow to nearly 1,200 by 1983. By then over 3,500 main and branch office systems could be installed representing a capital investment of over $500 million.

- Changing market conditions favor the CITITRAN distributed processing approach. Factors such as sharply decreasing minicomputer and intelligent terminal costs, increased use of EFTS technology, and check truncation should combine to increase CITITRAN's attractiveness to the banking community.

- The IBM Series/1 is an excellent choice to form the core of the CITITRAN system. Two new IBM systems, one from DPD, the System 8100, and the other from GSD, the Pacific System (IBM System 38), bear closer evaluation. The late 1979 availability dates for both systems puts pressure on an early decision to market CITITRAN. A preliminary review indicates that the newly announced IBM System 8140 is slightly (10%) more cost effective than the base processor IBM Series/1 configuration.

- Among hardware vendors, the greatest competition to the CITITRAN system can be expected from NCR and Burroughs which have distributed MICR data entry systems (Burroughs S1600 and NCR 7750), on-line teller supported miniprocessors, and a large installed base. NCR has a community banking application package and excellent distributed network architecture.

- Competition from commercial banks could come from those banks like Mellon who could use the IBM System 8100 to offer correspondent bank data services on a distributed basis. However, many banks may prefer to off-load their correspondent data processing, the profit for which is marginal.

- Among the remote computer services vendors, Automatic Data Processing is actively acquiring financial data processing companies. ADP will eventually integrate its acquisitions into a national financial services organization. The

Service Bureau Company is also becoming more active in the bank data processing marketplace.

- Those computer services vendors who are small and are inadequately financed and staffed to support distributed technology are least competitive.

- Offering the CITITRAN system as a turnkey operation (although transaction priced) is closer to facilities management (FM) than any other type of computer services offering. CITITRAN complements the traditional market segments (top medium to large banks) of FM companies. The FM managers may eventually turn to the IBM 8100 to extend their market to smaller banks. Electronic Data Systems and National Sharedata are potential competitors.

B. RECOMMENDATIONS

- INPUT believes that CITITRAN is a viable product and recommends market entry.

- Early and aggressive market entry is essential. Gradual introduction will give competition a chance to respond.

- INPUT's greatest concern about CITITRAN's viability as a CITIBANK venture rests with the time and expense to build up an effective marketing, service and maintenance organization.

- INPUT recommends that CITIBANK investigate the alternatives of acquisition and joint venture with facilities management companies. Viable candidates for acquisition may be Systematics and National Sharedata. Electronic Data Systems is a logical candidate for successful joint venture.

- INPUT has some concern as to acceptance on the part of small and medium-size bank executives of a CITIBANK sponsored system no matter how cost-effective. The image is that of the big money center city bank knowing what's best for the small town banker. It may be prudent to change the name CITITRAN to some less threatening acronym. Future market research to test respondent attitudes toward CITITRAN acceptance is recommended.

- User experience has found the Series/1 to be highly reliable. Some users have not had a CPU service call in over eight months. The second Series/1 processor should be eliminated from the CITITRAN base processor configuration.

- Users have found that electronic journaling satisfies teller and auditor requirements. The dual transaction tapes should be eliminated from the teller station configuration.

- Successful suport and maintenance of the CITITRAN system depend on diagnostic interaction with IBM operating systems. It is essential that the CITITRAN be transferred to the latest version of an IBM supplied operating system.

- CITITRAN needs the ability to correct program errors and make revisions and improvements to the software in a timely and cost effective manner. The CITITRAN system should be recoded at the earliest practical date in a high order language such as PL/1.

- Every effort should be made to eliminate the IBM 1255 MICR sorter/reader from the central clearing facility configuration. High speed electro-mechanical devices require excessive on-site maintenance. If a sorter must be retained then alternate sources should be considered.

- Every attempt should be made to have the CITITRAN system be modular in structure. System maintenance costs will be minimized if the home office configuration functions in a star network operating as an enhanced version of the branch base processor configuration.

- The use of magnetic tape for back-up and audit is not warranted. Introduction of magnetic tape adds another vendor to the configuration, complicating maintenance. A better alternative would be IBM diskette packs.

- The commercial loan function should be offered as an option initially because of the demand for this feature from small and medium-size banks.

- Leasing the CITITRAN as a turnkey system priced on a transaction basis will have great appeal to bank financial officers. CITIBANK should consider initially offering CITITRAN on a short-term lease (12 months) basis in order to increase initial market penetration. (Few companies have the financial resources to match such an offering in the mini marketplace!)

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III STUDY RESULTS

III STUDY RESULTS

A. CITITRAN EVALUATION

1. BASE PROCESSOR

- The evaluation which follows is based on the base processor configuration as shown in Exhibit III-1.

- Current planning calls for a single IBM 4955 processor configuration for very small banks or small branches with a back up processor configuration at a local CITITRAN office. However, the standard base processor configuration calls for dual IBM 4955 processors and disks, with a planned cost of $95,000.

- The IBM Series/1 processor is an excellent selection. In its study, "IBM Series/1 User Attitudes, Peripheral Opportunities, Product Plans And Competitive Impact" (1977), INPUT found early users gave uniform praise as to Series/1 price/performance, function ability, and reliability. The enthusiasm, with which the Series/1 was received, is shown by some of the user comments in Exhibit III-2.

- Vendors have not, until recently, provided enough disk storage for effective distributed data systems. In its study, "Distributed Data Processing Systems: Applications, Performance, Architecture" (1978), INPUT found that users wanted approximately 100 MB of local disk storage for distributed branch (unit

EXHIBIT III-1

CITITRAN BASE PROCESSOR CONFIGURATION

SERIES/1 EQUIPMENT	BANK SIZE DEPOSITS ($M)	
	10M	30M
	QTY	QTY
PROCESSOR (256K)	1	2
DISK 65mb		2
DISK 19.7 mb (CDC)	1	
PRINTER 400 lpm		2*
PRINTER 120cps	2*	
CONSOLE	1	2
TAPE		1
MAGAZINE DISKETTE	1	
DISKETTE		1
PROGRAMMABLE COMMUNICATION SUB SYSTEM	1	1

* BACK-UP AT ADMINISTRATIVE PLATFORM

EXHIBIT III-2

RESPONDENTS' COMMENTS ON SERIES/1 STRENGTHS

- "The System 7 has more raw computer power but the Series/1 is more effective because it has:
    - Better interrupt system.
    - Character orientation saves I/O overhead."
- "It's the best process control and message switching processor around."
- "It is ideal for teleprocessing. We could displace an IBM 370/138 with three Series/1s, one of which would be used as back-up. The 370/138 isn't built to pull all day, whereas the Series/1 I/O can."
- "People don't know it but Series/1 has better throughput capability than the IBM 370/138."
- "Series/1 combines process control and EDP capability. DPD doesn't know how to handle shop floor problems."

banks in multi-bank holding company) banking functions. This data supports the need for large capacity disk storage in the CITITRAN system.

- User experience has shown that print speed requirements nearly always exceed the vendor's most optimistic estimates. A recently completed study on standalone MICR processing systems showed that users wanted the original 300 lpm printer speed at least doubled. For reliability (maintenance) considerations, the two printer configuration is excellent. The combined output will likely satisfy the output requirements except when one printer is down. For the very small bank configuration, consideration should be given to using the 150 lpm printer rather than the 120 cps one for production output.

- The use of magnetic tape to establish an audit trail or for back-up does not appear warranted. Use of magnetic tape would add another non-IBM vendor to the base configuration, increasing preventive maintenance and repair requirements. Back-up and audit trail requirements can be better satisfied with the IBM magazine diskette.

- The IBM Series/1 processor has proven a highly reliable product. The fixed head, sealed disk design minimizes electromechanical failure potential. Series/1 user operating experience is shown in Exhibit III-3. INPUT does not believe that the use of dual Series/1 processors is cost effective for the base processor configuration.

2. CENTRAL CLEARING FACILITY

- The evaluation which follows is based on the central clearing facility with a planned cost of $80,000, as shown in Exhibit III-4.

EXHIBIT III-3

RESPONDENTS' EXPERIENCE WITH RESPECT TO IBM SERIES/1 RELIABILITY

- "We have yet to have a failure. Our first installation was January 28, 1977. We have five installed (as of 7/21/77) at remote locations. No service call yet!"
- "A good product - had since November 1976. No down time. The fixed head disk is very reliable."
- "The system is highly reliable. I don't know a user who is having any problems."
- "We use the system for production by day and development at night. It's never down."
- "I picked the system for use at remote locations because of its reliability."
- "The Series/1 has proven more reliable than the System 7. It operates 24 hours/day for 7 days/week."
- "The Series/1 is more reliable than our Honeywell process control computer."

EXHIBIT III-4

CITITRAN CENTRAL CLEARING FACILITY CONFIGURATION

EQUIPMENT	QUANTITY
IBM SERIES/1 PROCESSOR (256K)	1
DISK 19.7 mb (CDC)	2
PRINTER 120 cps (75 lpm)	1
DISKETTE	1
IBM 1255 SORTER/READER - 6 POCKET	1

- INPUT understands that the central clearing facility configuration is added to the base processor configuration for banks having more than two branches, and where the volume of transit and inclearings requires MICR reading and fine sorting speeds in excess of those currently available with the B1600 MICR entry system. The central clearing facility also acts as a message switching system in a star network for passing information between branches.

- The specified IBM 1255 sorter/reader operates at 500 documents/minute, whereas the Burroughs S1500 reads at 250 documents/minute. INPUT is aware that Burroughs is in the process of revising the software for the S1500 so that it will allow greater flexibility in fine sorting the inclearing checks to go to the branches for processing.

- INPUT believes that every effort should be made to eliminate the use of a MICR sorter/reader from the system. The CITITRAN system should use an improved version of the Burroughs S1600 instead. The CITITRAN system should be modular in nature to reduce maintainability requirements.

- In smaller banks, the central clearing facility function should be accomplished by the base processor configuration. An additional Series/1 should be added for message switching in larger banks only when the number of branches causes communication bottlenecks in the star network.

- In the event that a MICR sorter/reader is retained in the system, then alternates to the IBM 1255 should be considered. The IBM 1255 is an obsolete sorter/reader. INPUT user data indicates that the first pass reject rate for the IBM 1255 is greater than 2%. User data also indicates that a major portion (more than 20%) of proof and transit operational costs are expended in reject-re-entry operations.

- In that the CITITRAN system uses Burroughs S1600s, it is suggested that Burroughs be contacted concerning their to be announced product using enhanced S1600 technology for standalone MICR processing. Another MICR processing alternate is the 92660 MICR reader/sorter manufactured by

Magnetic Peripherals, Inc. (CDC). Reported user first pass reject rates are less than 1.5%.

- If a MICR sorter/reader must be used in the central clearing facility, then a faster (400 lpm) printer will be required.

3. TELLER/PLATFORM STATION

- INPUT's evaluation is based on the configuration priced at $6,000/teller and $4,000/platform station, as shown in Exhibit III-5.

- The configuration appears very cost effective. The HP 2645A is a highly reliable terminal with sufficient microprocessing capability to control the other peripherals on-line, and still have capacity to implement furture functions.

- The teller configuration is quite similar to the teller terminal system implemented by Home Federal Savings and Loan of San Diego, in their VISION distributed financial information network. The system is described in INPUT's report, "Computer Services Markets In The Savings And Loan Industry" (1977). Home Federal dropped the use of teller journal and audit tapes when the tellers and comptroller became confident in "electronic journaling." The configuration also used one printer shared between two teller units to reduce cost. By eliminating the journaling requirements, it may be possible to reduce printer complexity in the CITITRAN system.

4. SOFTWARE

a. CITITRAN Application Software Functions

- INPUT's evaluation is based on the software implementation of the application functions shown in Exhibit III-6.

EXHIBIT III-5

CITITRAN TELLER/PLATFORM STATION CONFIGURATION

EQUIPMENT	TELLER QTY	PLATFORM QTY
HP 2645A VIDEO	1	1
PIN PAD	1	
MAGNETIC CARD READER	1	
KEYBOARD	1	1
PRINTER/ENDORSER	1	
PRINTER (400 lpm)		1*

*ONE PER BRANCH/BANK

EXHIBIT III-6

CITITRAN APPLICATION SOFTWARE FUNCTIONS

APPLICATION FUNCTION	IMPLE-MENTED	PLANNED
DEMAND DEPOSIT ACCOUNTING (DDA)	B	
OVERDRAFT CHECKING	B	
TIME DEPOSIT ACCOUNTING		B
PERSONAL LOANS		O
GENERAL LEDGER		B
PROOF OF DEPOSIT	B	
TRANSIT/ INCLEARINGS	B	
ON-LINE CUSTOMER INFORMATION FILE	B	
ON-LINE CUSTOMER INQUIRY	O	
COMMERCIAL LOAN		O
NOW ACCOUNTS	O	
SHARE DRAFT ACCOUNTS	O	
MANAGEMENT INFORMATION SYSTEM (MIS)		O
MERCHANT TERMINALS		O

B - BASIC

O - OPTION

- The features offered under each application function are excellent. The on-line real time nature of the applications implementation will attract potential users.

- The range of user functional needs by bank size is given in the application analysis (Section V) of INPUT's report, "Computer Services Markets In Correspondent Banking" (1978).

- Although not all small to medium-size banks require all the implemented and planned functions outlined in Exhibit III-6, it is important to be able to both offer and demonstrate most of them with the initial offering.

- The General Ledger function is currently offered by enough computer services vendors offering correspondent banking processing that it should appear as part of the initial offering (as an option).

- Many small and most medium-size banks seek commercial loans. Most of those who have in-house systems purchase a commercial loan package (Florida Software). Other banks use accounting machines in a quasi-automated mode. It would be a definite plus if the CITITRAN system offered the commercial loan function as an option with the initial offering.

- The CITITRAN approach of offering a package of basic functions and a set of options is excellent. Some small banks currently do their DDP work on a remote batch basis with one computer services vendor and their savings work on-line with a savings and loan or other computer services vendor. By offering optionality, the small banks may be induced to go on-line with CITITRAN with the basic DDA function and later add savings, etc.

- The following functions, if not already included within the applications outlined in Exhibit III-6, are recommended:

  - Account reconciliation.

- IRA and Keogh accounts.

- Consolidated financial statement preparation.

- Daily and periodic statistical float analysis.

- Automatic consumer payments (i.e., pay-by-phone).

- Intra-account transfers (between checking and savings).

b. System Software

- INPUT understands that the current CITITRAN applications software has been implemented in assembly language. Experience has shown that systems coded in assembly language are very difficult to maintain, and even more difficult to update or extend. It is strongly recommended that CITITRAN be recoded in a high order language as soon as practical.

- INPUT suggest PL/I be considered and that the new implementation be accomplished using structured programming techniques. PL/I with its block and procedure structure is adaptable to the structured implementation approach. Shifting to PL/I will make accomplishing program revisions and improvements both possible, timely, and economical.

- INPUT understands that the current CITITRAN implementation uses its own real time operating system (COS). Using non-vendor supplied operating systems excessively complicates the problems of hardware and software maintenance. INPUT strongly recommends that when the CITITRAN system is recoded in a high order language (PL/I), that the implementation be transferred to the latest version of the IBM Series/I real time programming system (RPS-4).

B. COMPETITION

1. OVERVIEW

- The CITITRAN concept of marketing a turnkey mini standalone system to small to medium-size banks is closer to the concept of facilities management than to any other services type. However, servicing small to medium-size banks has heretofore been an incidental or add-on business to facility managers such as National Sharedata.

- The market that the CITITRAN system most directly addresses is the market for correspondent banking data processing services, the major users of which are small to medium-size banks. Therefore, in a real sense, the CITITRAN system concept is breaking new ground in the marketplace.

- INPUT's study, "Distributed Data Processing Systems: Applications, Performance, And Architecture," revealed the strong trend on the part of commercial banks to shift to distributed data processing. Thus, the time would appear opportune to market the CITITRAN system.

- Competition for EDP expenditures for correspondent bank functions (DDA, savings, loan, administration) comes from three sources: 1) the equipment vendors; 2) banks offering automated computer services; and 3) computer services vendors. The trend to distributed data processing will affect all three but in different ways.

- It will be difficult for the CITITRAN system to compete directly with EDP systems installed in-house in small to medium-size banks for a variety of reasons:

    - The small to medium-size banks are the main targets of Burroughs and NCR, which are both heavily committed to distributed data processing.

  - Many of these banks are comfortable with their current vendors and unless highly dissatisfied will remain with them as long as they provide competitive systems.

  - Small to medium-size banks have, in the past, tended to buy rather than lease their EDP systems and teller terminals.

  - The installed systems are used for more than just the set of turnkey applications offered by CITITRAN.

- The possible exception to replacing installed EDP systems will be with those recently formed or reorganized multi-bank holding companies where a data processing subsidiary has been established to define and install a uniform data system (hopefully distributed).

- IBM has not been notably successful in small to medium-size banks with either the System 360/30 or the System/3 Model 10. However, two recent product announcements have implications which will require reassessment of their intentions. IBM could become a threat to Burroughs and NCR as well as a barrier to successful CITITRAN market entry.

- Many very large and large banks which offer correspondent banking data processing services usually do so using the same software and systems as they use internally. The information system is often not well tailored to the small bank's real needs.

- Automated computer services are frequently offered for convenience, "to help service the correspondent." The INPUT study, "Computer Services Markets In Correspondent Banking," showed that a significant number (25%) of very large and large banks would just as soon not be in the correspondent bank data processing business. The tie-in to compensating balances for payment of correspondent data processing servicees is minimal (8%).

- Thus, small to medium-size banks who use correspondent bank data processing services from larger banks are prime candidates for the CITITRAN system.

- The CITITRAN system will be most competitive against remote computing vendors of correspondent bank data processing services. Many of the vendors are small, process in the remote batch mode, and are both inadequately capitalized and staffed to offer anywhere near the services offered by distributed systems such as CITITRAN. The large RCS vendors, such as ADP Network Services and SBC, are aware of changing market conditions and are actively acquiring either the small services vendors or their accounts.

2. EQUIPMENT VENDORS

a. IBM

- There is every indication that IBM is giving both DPD and GSD free reign to compete with each other. With the announcement of the IBM System 8100, DPD can move into GSD markets. The most recent announcement of the first of the "Pacific" systems, IBM System/38, allows GSD to operate up into DPD markets. Both announcements have significant implications with respect to the Series/1 selection for the CITITRAN system.

- The IBM 8100 has been designed specifically for distributed data processing. It is much more than an enhanced IBM 3790. It can be operated in a loosely configured mode (executive system DPDX) or closely coupled with large scale IBM hosts (executive system DPCX). The incorporation of both disk and diskette in the basic configuration coupled with the large capacity (256K to 512K) inexpensive memory technology make it highly competitive with larger IBM Series/1 such as is specified for CITITRAN.

- Exhibit III-7 illustrates a cost comparison between the CITITRAN base processor (Model 4955) and the IBM 8140. The IBM 8140 is more (10%) cost competitive.

EXHIBIT III-7

COST COMPARISON OF IBM SERIES/1 AND IBM SYSTEM 8100 IN CITITRAN BASE PROCESSOR CONFIGURATION

SUBSYSTEM	PURCHASE PRICE ($)	
	IBM SERIES/1	IBM 8140
CPU (4955E)	$11,000	$34,500
ADDITIONAL MEMORY (192K)	11,400	
DISK ATTACHMENT	815	
DISK (65 mb)	10,700	
DISKETTE ATTACHMENT	730	
DISKETTE	2,410	
COMMUNICATIONS CONTROLLER	2,835	
TOTAL	$39,890	$34,500

- Banks and computer services vendors could offer the IBM 8100 to small banks as a branch miniprocessor, in a distributed network for multi-bank holding companies, and as a standalone system for unit banks, loosely coupled under SNA/SDLC networking for remote processing. The twelve-month initial delivery date emphasizes the need to decide on making early entry of the CITITRAN system in the marketplace.

b. Burroughs

- Burroughs has a fairly comprehensive line of compatible processors to offer small to medium-size banks. Their current orientation with the B1800/2800/3800/4800 processors is that of a central host tied to on-line teller units, etc.

- The S1000 series equipment is well oriented to gathering and proofing MICR data at the source, and can be located at the larger branch level as in the CITITRAN system.

- With their Computer Management System (CMS) integrated hardware/software concept, Burroughs offers program compatibility across a wide range of equipment. This is comforting to exisiting customers.

- Burroughs has announced their heavy commitment to distributed data processing. With the development of the CMS Systems B80 and B800, Burroughs has minicomputers that can handle branch teller, ATM and platform operations.

- Burroughs can be expected to offer, by 1980, a branch control system that will tie all branch operations into a branch mini. However, they will probably retain the central host, at least in large banks, even if on a reduced scale (fewer disks, etc.).

c. NCR

- NCR has both announced its commitment to distributed data processing and has already implemented some of its new systems architecture in the financial community.

- The NCR 7750 distributed MICR data entry system is competitive with the Burroughs S1000 series and is installed in a number of small to medium-size banks, including bank holding companies (Barnett Banks of Florida).

- The NCR mini-VIPS system is a standalone mini-based MICR item processing system for medium-size banks which performs data capture, reject re-entry, and proof and transit applications.

- The NCR 8000 series processors are architecturally compatible. NCR's concept of migration path engineering extends down to the I-9250 and I-8230 minicomputers that have been integrated with teller terminals, etc., and application software to provide an on-line system for small banks ($10-35 million).

- With its excellent distributed network architecture, NCR can be expected to offer, by 1980, distributed branch banking systems. The network architecture supports, but does not require, a central host.

d. Other Mainframe Vendors

- The other mainframe vendors (CDC, Univac and Honeywell) are not contenders in banking. Honeywell has some EDP systems in commercial banks. Honeywell's presence shows up much more in the European market. CDC's presence is represented through its services subsidiary, Service Bureau Company (see computer services vendors below).

e. Mini Vendors

- The major mini vendors (Digital Equipment, Hewlett-Packard, and Data General) lack the technical expertise and software application packages to compete directly in the marketplace.

3. BANKS OFFERING CORRESPONDENT DATA PROCESSING SERVICES

- Citizen's and Southern National Bank specializes in correspondent bank data processing services in the Southeast. They process for some 160 banks in Georgia and adjoining states. The service is a by-product of an excess capacity situation. They operate four satellite centers using IBM System/3s for MICR data capture and report distribution. They are offering more on-line services such as audio inquiry from CIF. They are not planning to use distributed processing beyond the satellite centers. They are the major vendor in their area. Two other vendors (one bank and one computer services vendor) process for 100 and 60 banks respectively.

- Wachovia Bank had a data processing subsidiary for offering correspondent bank processing services. The CIMBA system used a B6700 to process 90 banks through 19 satellite sites with 400 video terminals on-line for inquiry. Eighty percent of its $10 million annual revenues were for processing outside North Carolina. The DP subsidiary was recently sold to ANACOMP, Inc., when the bank decided not to expand its correspondent data processing services beyond its current network.

- The Mellon Bank specializes in correspondent bank data processing services over a 500 mile radius. The services are offered by a separate DP center. The center processes 120 banks within a 200 mile courier radius and another 50 banks in a network configuration using B1700 satellites for MICR processing and video terminals for inquiry and "memo posting." Within the bank itself, they have a branch automation system with video teller terminals using pin pads and magnetic stripe card readers, ATMs, and platform CRTs. They plan to market this system to selected correspondents by 1980.

- The Bank of America's Decimus subsidiary processes over 400 banks from California to as far east as Chicago. The approach used by Decimus is more akin to facilities management in that they tailor the on-site equipment and method of processing for each bank on a long-term (more than two years) services contract. Some Decimus installations are remote batch to a service center, while others are on-line for savings and inquiry and remote batch transmission for MICR items.

- Harris Bank is a processor for 90 banks and S&Ls in the greater Chicago area. DDA processing is accomplished on dual B6700s and on-line savings on dual B4700s. MICR data comes in by courier (75 mile radius). They are offering on-line "memo posting" and inquiry using CRTs. They are developing a branch automation system for the bank itself using an Incoterm mini which will control teller terminals, platform terminals, and ATMs.

- As very large and large banks (most of whom use IBM mainframes) shift to distributed data processing, they can be expected to offer the IBM 8100 to their correspondents in a branch configuration whereby many of the day-to-day consumer transactions can be handled on a local basis leaving the central host to do transit, inclearing, and ACH processing.

4. COMPUTER SERVICES VENDORS

- The National Association of Bank Servicers has a membership of over 200, at least half of which are reported to be computer services vendors. Many of these vendors are inadequately staffed and financed to compete using the emerging distributed technology. Such vendors are viable candidates for acquisition. Some of the larger remote computer services (RCS) vendors, notably ADP and Tymshare, have active acquisition campaigns to consolidate this market segment.

- ADP Network Services acquired First Data Corporation and Financial Computer Corporation in 1976 and two correspondent banking data centers of Affiliated Computer Systems in 1977 to greatly expand its revenues in the banking and thrift indusries. Further details on ADP's activities are in Appendix A, Company Highlights.

- In 1977, the Service Bureau Company (CDC) began to offer correspondent bank data services to small to medium-size banks. The system utilizes the CDC 979 standalone MICR data entry system for satellite data capture, proof and transit, and transmission to a central host for remote batch processing. SBS is currently processing over 36 banks.

- The Itel Data Services Group, like ADP, is also highly acquistion oriented. They have acquired at least one computer services vendor in the New England area. Itel is offering full on-line teller, "memo posting," on-line CIF/inquiry services. Further details are found in Appendix A, Company Highlights.

- Systematics, Inc. is a specialist in commercial bank facilities management. From its 26 bank installations, Systematics also provides correspondent bank data processing services to 74 other banks. Systematics, Inc. is privately held and may be an ideal candidate for acquisition to provide the technical expertise for customer services and equipment maintenance. Further details on Systematics activites are in Appendix A, Company Highlights.

- Electronic Data Systems, Inc. provides facilities management and computer services to commercial banks. In 1978 (August), EDS serviced about 90 commercial banks and S&Ls, and did correspondent data processing for another 370. Annual revenues for financial services were approximately $30 million. EDS has the technical and management expertise to rapidly implement CITITRAN and would be an ideal candidate for joint venture. Further details on EDS are in Appendix A, Company Highlights.

- National Sharedata does facility management for approximately 40 large and very large banks. Through these centers they service an additional 410 banks through correspondent bank data processing. The services offered include an on-line information system (SOLIS). The system supports on-line teller terminals, a CIF, and account inquiry system and a direct data entry system.

National Sharedata has used the approach of forming a relationship with a major bank in a metropolitan area and then offering services to smaller banks in its geographic vicinity. This approach has been effective up to the onset of distributed data processing. National Sharedata has the management and technical expertise to assure early and successful entry of he CITITRAN system through joint venture and may be a candidate for purchase (they just replaced their President). They are a subsidiary of Western Union.

C. MARKET ANALYSIS

1. ASSUMPTIONS

- The CITITRAN system will not directly compete against installed in-house systems. INPUT's forecast is based on the growth of the computer services sector.

- The average annual growth rate (AAGR) for banks according to deposit size (see Exhibit III-8) will be for the forecast period the same as that for the last fifteen years.

- The average annual growth rate (AAGR) for branches (see Exhibit III-9) will be for the forecast period just under that for the last fifteen years (7%).

- The distribution of banking offices according to bank size (see Exhibit III-10) will not appreciably change during the forecast period.

- The distribution of EDP utilization according to bank size (see Exhibit III-11) will not appreciably change during the forecast period.

- Prices for CITITRAN services will be indexed (6%) with the consumer price index.

EXHIBIT III-8

DISTRIBUTION OF COMMERCIAL BANKS BY SIZE (1977-1983)

BANK DEPOSIT SIZE \ NUMBER OF BANKS	1977	1979	1981	1983	AAGR (%)
VERY LARGE > $1B	110	130	160	190	10%
LARGE $500-1B	110	130	155	180	8
MEDIUM $300-500M	100	115	130	150	7
$100-300M	700	805	920	1,050	7
SMALL $50-100M	1,500	1,655	1,825	2,010	5
$25-50M	2,800	3,130	3,460	3,820	5
$10-25M	5,180	5,710	6,300	6,945	5
< $10M	4,800	3,875	2,510	1,435	--
TOTAL	15,300	15,500	15,600	15,770	0.5%

EXHIBIT III-9

GROWTH OF COMMERCIAL BANK BRANCHES, 1977-1983

YEAR	NO. OF BRANCHES (AAGR 6.5%)
1977	34,330
1978	36,561
1979	38,937
1980	41,468
1981	44,163
1982	47,033
1983	50,009

EXHIBIT III-10

DISTRIBUTION OF BANKING OFFICES ACCORDING TO BANK DEPOSIT SIZE, 1977

PROPORTION (%) / BANK DEPOSIT SIZE	MAIN OFFICE ONLY (%)	BRANCHES			TOTAL (%)
		2-5 (%)	6-10 (%)	>10 (%)	
VERY LARGE > $1B	6%	12%	2%	80%	100%
LARGE $500-1B	12	9	0	79	100
MEDIUM $300-500M	20	15	18	47	100
$100-300M	28	25	21	26	100
SMALL $50-100M	36	35	24	5	100
$25-50M	41	49	8	2	100
$10-25M	64	35	1	0	100
< $5M	95	5	0	0	100

EXHIBIT III-11

DISTRIBUTION OF EDP UTILIZATION ACCORDING TO BANK DEPOSIT SIZE (1976)

EDP USAGE	SMALL		MEDIUM	LARGE	VERY LARGE
	DEPOSITS <$10M	DEPOSITS $10-$100M	DEPOSITS $100-500M	DEPOSITS $500M-$1B	DEPOSITS >$1B
IN-HOUSE EDP	8.8%	37.1%	79.0%	92.0%	95.0%
OUTSIDE SERVICES	54.6	59.5	20.0	8.0	5.0
NOT AUTOMATED	36.6	3.4	1.0	0	0
TOTAL	100.0%	100.0%	100.0%	100.0%	100.0%

2. MARKET POTENTIAL

- The detailed structure of the commercial bank marketplace is contained in INPUT's study, "Computer Services Markets in Correspondent Banking." The structure presented below is extended and amplified to reflect the relationship of the CITITRAN system to the marketplace.

- The calculated distribution of the number of commercial banks by deposit size from 1977 to 1983 is shown in Exhibit III-8.

- Although the annual rate of bank growth in an absolute sense is low (0.5% AAGR) branches are growing at 6-7% AAGR, as shown in Exhibit III-9. This trend encourages the use of distributed data systems such as CITITRAN.

- The proportion of banks having branches, distributed according to bank deposit size is shown in Exhibit III-10. Very few (6%) very large banks are in unit banking states, however, 80% of very large banks have more than ten branches. Conversely, over half of all banks with deposits under $300 million have less than five (some none at all) branches.

- Utilizing the forecasted data on growth and distribution of both banks and branches, a forecast of the distribution of branches among all banks (both those who have in-house EDP systems or use computer services) was determined (see Exhibit III-12).

- By applying the distribution of the mode of EDP utilization (in-house EDP or outside services as shown in Exhibit III-11), for medium size banks with deposits between $100 and $300 million, and small banks having deposits between $10 million and $100 million, a distribution of the banks and branches who use correspondent bank data processing services was determined (Exhibit III-13) for the forecast period 1979-1983.

- The market forecast (dollars) of correspondent bank data processing services in INPUT's study, "Correspondent Banking," understates the potential market

EXHIBIT III-12

DISTRIBUTION OF BANK BRANCHES ACCORDING TO BANK DEPOSIT SIZE, 1977-1983

BANK DEPOSIT SIZE	AVERAGE NO. OF BRANCHES PER BANK	PROPORTION OF BANKS WITH BRANCHES	1977		1978		1981		1983	
			NO. OF BANKS	BRANCHES	NO. OF BANKS	BRANCHES	NO. OF BANKS	BRANCHES	NO. OF BANKS	BRANCHES
VERY LARGE > $1B	50	94	110	5,170	130	6,110	160	7,520	190	8,930
LARGE $500-1B	35	88	110	3,388	130	4,004	155	4,774	180	5,544
MEDIUM $300-500M	20	80	100	1,600	115	1,840	130	2,080	150	2,400
$100-300M	10	72	700	5,040	805	5,796	920	6,624	1,050	7,350
SMALL $50-100M	7	64	1,500	6,720	1,655	7,414	1,825	8,176	2,010	9,004
$25-50M	4	59	2,800	6,608	3,130	7,387	3,460	8,166	3,820	9,015
$10-25M	3	36	5,180	5,594	5,710	6,167	6,300	6,804	6,945	7,500
< $5M	1	5	4,800	240	3,875	194	2,510	126	1,435	72
TOTAL			15,300	34,360	15,550	38,912	15,600	44,270	15,700	49,815

EXHIBIT III-13

DISTRIBUTION OF BANKS AND BRANCHES USING CORRESPONDENT BANK DATA PROCESSING SERVICES, 1979-1983

BANK DEPOSIT SIZE	1979		1981		1983	
	BANKS	BRANCHES	BANKS	BRANCHES	BANKS	BRANCHES
MEDIUM $100-300M	161	1,159	184	1,324	210	1,470
SMALL $50-100M	993	4,928	1,095	4,905	1,206	5,402
$25-50M	1,878	4,432	2,076	4,899	2,292	5,409
$10-25M	3,426	3,700	3,780	4,082	4,167	4,500
TOTALS	6,458	14,219	7,135	15,210	7,875	16,781

(dollars) for the CITITRAN system. INPUT forecast the computer data processing services, whereas the CITITRAN system offers both more automation and teller and platform equipment in its bundled transaction price structure. INPUT has taken an alternative approach to forecasting the CITITRAN market.

- The 1979 forecast of market potential for the CITITRAN system is nearly $800 million (Exhibit III-14). The system can be marketed to approximately 6,500 banks whose deposits are between $10 million and $300 million. The forecast was accomplished by assuming an average deposit size for each bank size. The average cost/million dollars of deposits for banks of various deposit size were interpolated from the CITITRAN data (figures 7-1 to 7-3) furnished to INPUT. The average cost/bank/year was calculated for each bank size.

- The market potential is over twice that forecast by INPUT for correspondent bank data processing services for the market segment under consideration. Applying a 40 month payout factor to the CITITRAN pricing structure yields equivalent installed system (hardware, software, maintenance) costs which appear reasonable for the intended CITITRAN base processor, back office, central clearing facilities, platform and teller costs. For example, the equivalent cost for a bank having an average of two branches, and deposits of $35 million is $440,000, and a bank with an average of seven branches with deposits of $140 million is $1.5 million.

- Applying the latest BAI data on proportion of data automation costs to total bank operating expenses to the data on total bank expenses by bank size from the 1977 FDIC Annual Report (Exhibit III-15), the average annual DP expenditures for medium-size banks is $500,000 as contrasted to an average cost of $437,000 for the CITITRAN system. There are two probable explanations for the differential: 1) the FDIC data contains all DP expenses including trust and such RCS services as financial planning and budgeting; and 2) data from other INPUT studies and from the FDIC indicate that the check processing volume per million of deposits are somewhat higher than those used in the furnished CITITRAN data (figures E-3 to E-5).

EXHIBIT III-14

FORECAST OF MARKET POTENTIAL (DOLLARS) FOR CITITRAN SYSTEM, 1979

BANK DEPOSIT SIZE	NUMBER BANKS	AVG. NO. BRANCHES PER BANK	AVERAGE DEPOSIT SIZE ($M)	CITITRAN				MARKET POT. ($M)
				AVG. COST PER $M OF DEP. ($)	AVERAGE COST PER MO. ($K)	AVERAGE COST PER YR. ($K)	40 MO. EQUIP. PAYOUT COST ($M)	
MEDIUM $100-300M	161	7	$140	$260	$36.4	$437	$1.46	$ 70
SMALL $50-100M	993	5	70	295	20.7	248	0.83	246
$25-50M	1,878	2	35	315	11.0	132	0.44	248
$10-25M	3,426	1	15	350	5.3	63	0.21	216
TOTAL								$780

EXHIBIT III-15

COMMERCIAL BANK ANNUAL DATA PROCESSING EXPENDITURES ACCORDING TO BANK DEPOSIT SIZE, 1978

BANK DEPOSIT SIZE	EXPENSES PER BANK ($M) (1)	PROPORTION D.P. OPERATING EXPENSES (%) (2)	D.P. ANNUAL EXPEND. ($K)
MEDIUM $100-300M	$6.28	8.0%	$502
SMALL $50-100M	3.78	8.5	321
$25-50M	2.05	8.7	178
$10-25M	.99	9.0	89

(1) FDIC 1976 ANNUAL REPORT

(2) ABI SURVEY 1978

- The forecast of market potential for CITITRAN for 1981-1983 (Exhibit III-16) was accomplished in the same manner. The CITITRAN prices were increased (6%) to forecast in current dollars.

3. MARKET SHARE

- INPUT has calculated CITITRAN market share for the period 1979-1983 according to a range of market penetration (Exhibit III-17). Capturing just 5% of the market potential on initial entry will yield 1979 revenues just under $40 million. Increasing the penetration to 10% by 1981 will yield about $100 milion and to 15% by 1983 will yield $180 million for a five year AAGR of 36%, a very attractive market opportunity.

- Capture of just 5% of this 1979 market will mean marketing CITITRAN to over 300 banks. It will mean delivering over 900 branch and main office configurations, and financing over $100 million worth of EDP equipment. This first year projection is likely optimistic and will not occur unless CITIBANK is ready to "hit the street" very early in the year.

- To capture 15% of the market potential by 1983 will mean marketing CITITRAN to nearly 1,200 banks over five years. It will mean delivery of over 3,500 branch and main office configurations and financing over $500 million in EDP systems over the same time frame.

4. FUTURE MARKET CONDITIONS

- Research performed studying the market for MICR sorter/readers indicated that bankers expected distributed data processing and less check technology to effect significant changes in the way MICR items are handled in the 1983-1988 time frame. In particular, the respondents felt:

EXHIBIT III-16

FORECAST OF MARKET POTENTIAL (DOLLARS) FOR CITITRAN SYSTEMS, 1981-1983

BANK DEPOSIT SIZE	1981			1983		
	NO. OF BANKS	AVG.COST PER YR. ($K)	MARKET POT. ($M)	NO. OF BANKS	AVG.COST PER YR. ($K)	MARKET POT. ($M)
MEDIUM $100-300M	184	491	90	210	552	116
SMALL $50-100M	1,095	279	306	1,206	313	377
$25-50M	2,076	148	307	2,292	167	383
$10-25M	3,780	71	268	4,167	80	333
TOTAL			971			1,209

EXHIBIT III-17

FORECAST OF MARKET SHARE FOR CITITRAN SYSTEMS, 1979-1983

BANK DEPOSIT SIZE	1979				1981				1983			
	MKT. POT. ($M)	MARKET SHARE ($M)			MKT. POT. ($M)	MARKET SHARE ($M)			MKT. POT. ($M)	MARKET SHARE ($M)		
		5%	10%	15%		10%	15%	20%		15%	25%	40%
MEDIUM $100-300M	$ 70	$ 4	$ 7	$ 11	$ 90	$ 9	$ 14	$ 18	$ 116	$ 17	$ 29	$ 46
SMALL $50-100M	246	12	25	37	306	31	46	61	377	57	94	151
$25-50M	248	12	25	37	307	31	46	61	383	57	96	153
$10-25M	216	11	22	32	268	27	40	54	333	50	83	132
TOTALS	$780	$ 39	$79	$ 117	$ 971	$ 98	$146	$194	$1,209	$181	$ 303	$482

- Less check technology (EFTS/ACH) and popularized credit transfer systems (pay-by-phone and credit cards) will restrain check volume growth 20% by 1988.

- MICR check truncation will become the dominate method of item processing (60%) by 1988.

- Consumers will accept country club or similar statements with either check facsimile or 40 characters of payee descriptive notation as part of their monthly statement.

- The study also forecast that by 1983 MICR distributed data systems (Burroughs S1600, NCR 7750) will rise to 30% of the units shipped.

- The CITITRAN system is poised to take better advantage of the changing market conditions than most alternative systems. The distributed nature of the approach, and the use of the Burroughs S1600 will decrease chances for obsolesence. The system has the potential to be upgraded to optimize the handling of check truncation when market conditions require its use.

5. MARKETING AND TECHNICAL REQUIREMENTS

a. Marketing Requirements

- The CITITRAN system could be introduced at a major banking convention and supported thereafter by an effective advertising campaign to raise user awareness of the total on-line systems approach offered.

- IBM, Burroughs and NCR all use favored banks to develop and demonstrate their banking systems. CITIBANK must make long-term arrangements with banks to establish test sites. Establishing a relationship with a multi-bank holding company as well as the First National Bank of Brevard would better permit demonstrations of CITITRAN's full range of capabilities.

- Successful market penetration by CITITRAN requires that CITIBANK have a marketing organization having a high degree of technical expertise in all aspects of bank information systems. The marketing personnel must not only know how to sell, but they must be "banking experts" and be familiar with the small and medium-size bank's operational requirements.

- Marketing personnel must be not only well versed in federal regulatory and statuatory requirements, but also those of the particular state in which the bank is located. Therefore, CITIBANK should recruit selected marketing personnel from those regions of the country targeted for market entry. This requirement is particularly applicable to the southeastern United States (e.g., North Carolina, Georgia and Texas).

- The CITITRAN system should be marketed through either a separate bank services subsidiary or through joint venture.

- An effective demonstration program is a must. The demonstration program is useful both at conventions and for demostration at the bank test sites. Bankers are by nature conservative. Many bankers will buy only after they see the system successfully work and hear it enthusiastically endorsed by another banker.

- The CITITRAN system should be marketed in a modular fashion, in respect to both function and pricing. The small bank will likely initally want only the basic system, whereas medium-size banks will want such functions as overdraft protection and commercial loans. Modularity in price and growth without equipment replacement are keys to success.

- The marketing organization should be supported by an effective education and training program.

- The marketing organization must be supported by a national service and maintenance organization. INPUT believes this is one of the most difficult issues facing CITIBANK. Competent service and maintenance personnel are in short supply, driving support and maintenance costs sharply upward. CITIBANK must either build a new organization, acquire one, or contract with a third party maintenance vendor such as Sorbus.

- CITITRAN must be offered to small to medium-size bank executives as a total service; that is, hardware, software, communications, technical support, and service and maintenance. There should be only one CITITRAN representative to call for any service or support the bank operations people require.

- Particular attention should be payed to marketing the CITITRAN system to multi-bank holding companies. Such companies frequently operate in more than one state and in widely dispersed geographic areas. Geographic dispersion tends itself to distributed processing.

b. Technical Requirements

- Specific hardware and software technical requirements were reviewed in conjunction with the evaluation of CITITRAN in Section III.A. above.

- The realized profitability of CITITRAN hinges on the issue of reliability and maintainability. Selling and installing CITITRAN takes one team of people but servicing and maintaining the installed systems requires still another.

- The system hardware must be highly reliable. The distributed nature of CITITRAN should be a significant improvement over existing on-line centralized host systems. To the greatest extent practical, failed modules should be replaceable on-site with repair accomplished at service centers.

- The software must work. Software bugs must be quickly located and rapidly corrected. This is best accomplished if the software is coded in a high order language (such as PL/I).

- The software must be modularized and structured such that improvements and revisions can be effectively accomplished.

- Basic maintenance requirements are:
  - On-site or close proximity proprietary personnel.
  - One-hour response time to repair.
  - Effectively trained service personnel.
  - Adequate on-site and district spare parts inventory.
  - No more than one-hour preventive maintenance per day.

INPU

APPENDIX: COMPANY HIGHLIGHTS

APPENDIX: COMPANY HIGHLIGHTS

- Automatic Data Processing, Inc.
- Electronic Data Systems Corporation
- Itel Data Services Group
- Systematics, Inc.

COMPANY HIGHLIGHT

AUTOMATIC DATA PROCESSING INC.
405 Route 3
Clifton, NJ 07015
(201) 472-1000

Frank A. Lautenberg, Chairman & CEO
Public corporation, NYSE
Total employees: 7,500
Total revenues, fiscal year end 6/30/77: $245,487,000

THE COMPANY

- Automatic Data Processing, Inc. (ADP) principally provides packaged general business data processing services. In the last year it has increased its industry-specialized services and is now offering turnkey small business computer systems as part of some services.

- Three acquisitions in FY 1977 led to restated revenues and earnings for 1976:

    - The CPI Group Incorporated, Newport Beach, CA, with 6/30/76 revenues of approximately $3.3 million and net earnings of approximately $450,000. It provides computerized administrative, trustee and custodial services for individuals, proprietorships and partnerships, and small corporations.

    - First Data Corporation, Waltham, MA with 3/31/76 revenues of $5.8 million and net earnings of $700,000. FDC provides DEC 10-based interactive, remote batch and local batch processing services to primarily government, manufacturing, and distribution clients.

    - Financial Computer Corporation, Clifton, NJ, with FY 1977 revenues of $2 million. FCC provides 78 savings and loan associations and 11 mortgage bankers in New York and New Jersey with on-line financial industry accounting services. It was acquired by ADP in March 1977.

- One of the largest computer services companies in the world, ADP grew from $163.2 million in 1975 to $199.2 million in 1976 (restated) a growth of 22%. ADP's 1977 revenues reached $245.5 million, a 23% increase over 1976 revenues. The company earned $23.3 million in 1977, a growth of 25% over restated 1976 net earnings of $18.7 million. Restated net earnings per share during the same period increased 22% from $1.28 to 1.58 with 14,786,000 shares outstanding.

- The major management challenges are:

    - To harmoniously integrate new acquisitions into the company.
    - To further integrate the network and commercial services into a

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total package competing effectively against the in-house small business computer systems.

- Integrate mini/microcomputer products into the total service package offered by ADP.
- Maintain the growth & profitability momentum to enable the company to maintain its acquisition momentum.

- There are over 7,500 employees working at ADP. They are segmented as follows:

Marketing	15%
Administration	12
R&D	5
Operations	68
	100%

KEY PRODUCTS AND SERVICES

- ADP revenues are generated by the following groups:

Commercial Services	50%
Network Services	15
Special Industry Services	35
	100%

- Despite an acceleration of emphasis from batch processing to remote computing, the latter still constitutes 20% of revenues with batch services accounting for the balance.

- The Commercial Services group provides payroll processing, accounts payable, accounts receivable, general ledger and financial reporting services to over 40,000 accounts.

- Cyphernetics forms the core of the Network Services Division. Delos and First Data will round out the on-line processing services provided by ADP. All three of these on-line processing groups use the DEC System 10 as their mainframe processor.

- Special industry services include:

  - ADP Autonet-management information systems for over 200 liquor wholesalers
  - ADP Dealer Services-accounting and inventory services to approximately 6,000 auto, farm, and industrial dealers in 50 states.

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- Banking and Thrift Services-batch and on-line accounting services to commercial banks and thrift institutions.
- Financial Data Services-computerized recordkeeping and securities management services for the investment community. ADP recently announced an agreement with the Midwest Stock Exchange Service Corporation (MSESC) whereby MSESC's approximately 50 customers will have the opportunity to convert to ADP's brokerage data processing services.
- Real Estate Management Services-full service ADP FASTRENTS, used by builders, developers, banks, and property owners and managers of more than 600,000 rental units.
- Health Information Services-on-line, batch, and remote batch processing services to more than 190 nursing homes and medical centers.

- ADP also offers retirement plan accounting and administration services for individuals and small corporations.

APPLICATIONS ADP application revenues are derived as follows:

	Batch	On-Line	Total
General Business	44%	4%	48%
Scientific & Engineering		1	1
Specialty Applications	35	5	40
Utility		10	10
Other	1		1
TOTAL	80%	20%	100%

INDUSTRY MARKETS

- ADP provides services to more than 45,000 firms from a variety of industries, primarily manufacturing, distribution, and banking, as shown below:

- Manufacturing: discrete and process	34%
- Banking and finance	30
- Distribution - wholesale and retail	28
- Utilities	3
- Medical/Hospital	3
- Government	2
	100%

- Occasionally ADP also serves the services industry: accountants, construction companies, hotels, theaters, architects, engineers, and research firms.

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GEOGRAPHIC MARKETS

- ADP branch and sales offices are distributed throughout the U.S. and Europe. Recently the firm has also opened offices in Brazil. ADP's estimate of its 1977 revenue distribution by geographic region is as follows:

New England	10%
Northeast	30
North Central	20
Southeast	10
Midwest	10
Pacific States	9
South Central	5
West	2
International	4
Total	100%

- ADP U.S. facilities and locations are as follows:

Akron, OH
Albany, NY
Ann Arbor, MI
Ashland, KY
Atlanta, GA
Auburn, MA
Baltimore, MD
Bath, ME
Binghamton, NY
Birmingham, AL
Boston, MA
Buffalo, NY
Centralia, IL
Chicago, IL
Cincinnati, OH
Cleveland, OH
Clifton, NJ
Coldwater, MI
Columbus, OH
Dallas, TX
Dayton, OH
Denver, CO
Detroit, MI
District of Columbia
East Brunswick, NJ
East Hanover, NJ
Florence, KY
Fremont, OH
Fort Worth, TX
Grand Rapids, MI
Hartford, CN
Holland, MI
Honolulu, HI
Houston, TX
Indianapolis, IN
Kalamazoo, MI
Kansas City, KS
Kansas City, MO
Kensington, MD
Lansing, MI
Long Beach, CA
Long Island, NY
Los Altos, CA
Los Angeles, CA
Louisville, KY
Lutherville, MD
Mason, MI
Miami, FL
Milwaukee, WI
Minneapolis, MN
Morriston, NJ
Mountain View, CA
Nashville, TN
Newport News, VA
New York, NY
Norfolk, VA
Orlando, FL
Philadelphia, PA
Phoenix, AZ
Pittsburgh, PA
Portland, OR
Princeton, NJ
Providence, RI
Richmond, VA
Rochester, NY
San Diego, CA
San Francisco, CA
Seattle, WA
Stamford, CT
St. Louis, MO
St. Paul, MN
Syracuse, NY
Tampa, FL
Toledo, OH
Troy, OH

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- International locations are in Sao Paulo, Brazil; Calgary, Toronto, and Vancouver, Canada; Antwerp and Brussels, Belgium; Dublin, Ireland; Milan, Italy; Amesterdam, Rotterdam, and The Hague, Netherlands; Zurich, Switzerland; Birmingham, London, and Manchester, United Kingdom; and Cologne, Dusseldorf, and Frankfurt, West Germany.

COMPUTER HARDWARE AND SOFTWARE: ADP uses a variety of computer equipment, as shown below:

55	IBM	360 and 370, approximately 15 of these are 370 series
25	DEC	PDP-10
125	DEC	PDP-8 & PDP-11
2	Burroughs	4700
3	Honeywell	2200
3	Sperry Univac	418

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COMPANY HIGHLIGHT

ELECTRONIC DATA SYSTEMS CORPORATION 7171 Forest Lane Dallas, TX 65230 (214) 661-6000	Ross Perot, President and Chairman of the Board Public corporation Total employees: 6,386 Total sales, fiscal year end, 6/30/77: $164,188,000

THE COMPANY

- Electronic Data Systems Corporation (EDS) was founded in June 1962 by Ross Perot, currently Chairman of the Board and Chief Executive Officer. It is the premier facilities management (FM) company in the United States, with FM contracts generating approximately 91% of revenues in 1977. (Remaining revenues are derived from interest and the sale of assets.) The company designs and installs software systems and operates computer facilities for its customers.

  - Approximately $70 million in fiscal year 1976, or 52% of total revenues is derived from processing of Medicare, Medicaid, and CHAMPUS. Contracts between EDS and its customers generally have 5-10 year terms.
  - Other revenues are derived from commercial banks, savings and loan institutions, credit unions, and retailers.

- Between 1976 and 1977, revenues grew from $132.9 million to $164.2 million, an increase of 23%, while earnings increased 21% from $13.6 million to $16.4 million. The company has been a major cash generator. In the last year its cash or cash equivalent position grew from $42 million to $55 million while the company paid $7.5 million in dividends.

- Recently, EDS has begun to bid not only on insurance processing contracts but also fiscal agent and intermediary contracts. Thus, EDS has become the insurer and administrator on the new contracts and has assumed total operating responsibility for the customers' data processing installations as well.

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- EDS's major strengths are its ability to hire, train, mobilize, and manage people. This ability has helped it to add large segments of business without a deterioration in service.

- Another asset of the company is the software which has been developed for the health care and the financial industry. To date, $50 million of software development costs have been expensed. Portions of this software can frequently be utilized in new installations providing the company with the opportunity to leverage the software.

KEY PRODUCTS AND SERVICES

- Of the $133 million of revenues in FY 1976, $70 million was derived from data processing of Medicare, Medicaid, and CHAMPUS. This business represents a major source of revenue for EDS. Exhibit #1 shows recent EDS contracts.

- California accounts for almost 1/3 of EDS health insurance processing revenues with the following breakdown:

- Medi-Cal	$13 million
- Medicare	6 million
- CHAMPUS	1 million
TOTAL	$20 million

- EDS' dominance of the health insurance market is both its greatest asset and liability
    - Its experience and competence is an obvious asset. It currently handles 20% of all claims processing for state health-care programs across the nation.
    - Recently EDS has received court challenges from low bid competitors which lost contracts to EDS, and from some state aid federal government agencies. These challenges may provide competitors with opportunities to enter EDS-dominated markets.

- Of EDS's 6386 employees, 50 are salesmen.

APPLICATIONS EDS offers primarily health care processing applications, although it also offers financial applications.

GEOGRAPHIC MARKETS EDS processes for state government agencies and corporations throughout the U.S. as well as servicing governments in the Middle East.

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COMPUTER HARDWARE AND SOFTWARE

- EDS operates 62 computers in its operations. They are mostly IBM mainframes, except for several Burroughs, and two Honeywell systems.
- The equipment is located in computer centers in Michigan, Connecticut, Massachusetts, New York, Vermont, Pennsylvania, Illinois, Ohio, South Carolina, Texas, Wisconsin, Florida, California, Oregon, North Carolina, Puerto Rico, Washington, and Arkansas.

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EXHIBIT 1

EDS'RECENT CONTRACTS FOR MEDICARE, MEDICAID, AND CHAMPUS

YEAR	STATE	PROGRAM	COMMENTS	DURATION
Nov. 1975	Washington State	Medicaid	Full EDP service including on-line claims examination	2 years
June 1976	Alabama	Medicaid	Full FI* & EDP service	1 year
June 1976	Indiana	Medicare	Full EDP service	28 months
July 1976	Washington State	Medicaid	Nov. 75 contract extended to 5 years	5 years
August 1976	Texas	Medicaid	Full FI* & EDP service on risk. Approx. $250 million/year	4 yr. 8 mo.
August 1976	Florida	Medicare	EDP facilities management only	3 years
Sept. 1976	Idaho	Medicaid	Full FI* & EDP service No risk	2 yr. 6 mo.
Sept. 1976	Iran		Turnkey implementation of complete social security. Approx. $40 million revenue	3 years
Oct. 1976	Massachusetts	Medicare	Contract renewed to implement AMS	3 years
Dec. 1976	California Oregon Nevada Arizona Utah	CHAMPUS	EDP service only. This contract was taken away from HAS for poor performance and awarded to California Blue Shield and EDS.	Month-to-Month
Jan. 1977	North Carolina	Medicaid	EDP service only. Replaces HAS	Drugs-FY'78 Other-6/77
June 1977	New Mexico	Medicaid	Replaces Dikewood Industries	3 years

* Fiscal Intermediary

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COMPANY HIGHLIGHT

ITEL DATA SERVICES GROUP
3 Corporate Drive
White Plains, NY 10604
(914) 694-8800

William Bird, President
Wholly owned subsidiary of Itel Corporation
Total employees: 950
Total revenues, fiscal year end 12/31/76: $41,900,000

THE COMPANY

- ITEL Data Services Group (DSG) offers packaged batch and on-line data processing services to 11,000 clients in a variety of industries, including manufacturing, wholesale, retail, banking, law, trucking, architecture, accounting, and engineering. It also provides management and other information services.

- DSG revenues increased from $25.9 million in 1975 to $41.9 million in 1976, a growth of 62%. Earnings during the same period jumped more than 80% from $2.2 million to $4.0 million.

- The Data Services Group is highly acquisition-oriented. Four companies acquired in December 1976 will almost double DSG revenues in 1977. In addition, each acquisition has enabled the company to enter a new market area. The acquisitions and their markets are as follows:

Name of Company	Markets/Products	Estimated 1977 Revs.
Computer Dimensions	On-line inventory control and accounting functions for auto dealers, credit unions, and insurance agents. (Centers in Dallas, Detroit, and L.A.)	$20M
AutEx Inc.	Block securities trading information services for brokerage and institutional investors.	$ 8M
Utility Network of America	On-line scientific computation using Univac 1108 systems	$ 7M
Tax Accountants Computer Services	Computerized tax computation services for accountants.	$ 2M

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- In addition, DSG acquired Multiple Access, Inc. in April 1977. Multiple Access provides remote batch network information services.

- The major challenge facing management is to integrate the acquired companies effectively to obtain the benefits of economies of scale without destroying the entrepreneurial spirit which got the companies started.

KEY PRODUCTS AND SERVICES

- In 1976, 68% of DSG revenues were derived from the sale of batch processing and 32% from on-line processing.
    - The average annual revenues from an on-line client in 1976 were nearly ten times greater than the average revenues of an off-line client ($31,000 versus $3,311).
    - Since 1972, on-line clients have shown a compound growth of 100% in both revenues and numbers. In contrast, off-line clients have grown only 31% in revenues and 43% in numbers during the same period.

- By fiscal year end 1977, DSG expects to have 1,400 employees and 18 data centers. Revenues will be segmented as shown below:

Service	% of Total Revenues
Commercial Data Services (accounts receivable, payroll, general ledger)	42%
Transportation Data Services (motor freight, auto dealers)	22%
Financial Data Services (commercial banking services, savings, block trading)	14%
Business Forms	9%
Scientific Data Services	7%
Insurance Data & Network Data Services	6%
	100%

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- Its 950 employees in 1976 were distributed as follow:

OPERATIONS		60%
TOTAL MARKETING		22%
Sales	6	
Marketing	16	
ADMINISTRATION		10%
R&D		8%
		100%

APPLICATIONS DSG concentrates on general business applications. It is one of the largest processors of general ledger and financial statements for accountants and the business community. In addition, it provides inventory control, sales analysis, and bill of materials processing applications.

INDUSTRY MARKETS The company's major revenues are derived from the distribution industry, as shown below:

Distribution-wholesale	60%
Manufacturing-discrete	20%
Banking	10%
Transportation	10%
	100%

GEOGRAPHIC MARKETS DSG has offices in White Plains, Dallas, Wellesley, New York City, Salt Lake City, and Pittsburgh. Computer Dimensions, its subsidiary, has data centers in Dallas, Detroit, and Los Angeles.

COMPUTER HARDWARE AND SOFTWARE DSG maintains 18 computer centers throughout the U.S., including a central center in White Plains. This central site has two IBM 370/155 and one IBM 360/65 mainframes. ITEL will shortly replace the IBM 360/65 with an ITEL AS-5 system.

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COMPANY HIGHLIGHT

SYSTEMATICS, INC.
212 Center Street
Little Rock, Arkansas 72201
(501) 372-6141

Walter Smiley, President
Private corporation
Total employees: 700
Total revenues, fiscal year end 3/31/77: $13,300,000

THE COMPANY

- Systematics, Inc. was founded by Walter Smiley in 1968 to provide facilities management (FM) services to commercial banks. This is still the company's targeted market area. Major competition is from Electronic Data Systems and National Sharedata.

- It is a rapidly growing company. Revenues increased 49% from $8.9 million in FY 1976 to $13.3 million in FY 1977, FY 1976 revenues increased 44% over FY 1975 revenues of $6.2 million. Pre-tax earnings grew 109% between FY 1976 and FY 1977 from $451,000 to $963,000. FY 1975 pre-tax earnings were $351,000.

- Management anticipates FY 1978 pre-tax earnings to reach $1.6 million on revenues of $18 million.

- Systematics' management prides itself on the quality of its service and its commitment to bank software.

    - The FY 78 budget for R&D is $1.1 million and supports 52 full-time people.
    - Since 1968, the company has lost only two bank customers. The client base has grown from 65 commercial banks in 1975 to 100 in 1977. The company has only three people in sales; however, most new customers are acquired through referrals.

KEY PRODUCTS AND SERVICES

- All of Systematics' revenues derive from facilities management contracts with commercial banks in the US.

- Banking services include:

    - Central Information File
    - Integrated Monetary Processing and Control System (IMPACS)
    - Savings: passbook, clubs, corporate savings accounting, and IRAs.
    - Certificates of Deposit
    - Time Deposits Open Accounting (TDOA)

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- Investments: municipal, federal, industrial, and coporate bonds; treasury bills
- Personal trust
- Loans: mortgage, commercial, construction, inventory (including dealer floor plan), installment (student, mobile home, regular, balloon notes), with a charged off loan capability for all loan types.
- Combined statements
- Credit card: cardholder and merchant processing
- Payroll
- Financial Management System: automated general ledger, budgeting, historical analyses, cost allocations, and responsibility center reporting.

- All banking services are available for on-line or batch modes and have multi-bank, multi-branch capability.

- The system supports teller machines teller machines, CRTs, audio response units, automate teller machines, and other media devices.

APPLICATIONS Specialty services with banking applications.

INDUSTRY MARKETS Commercial banks.

GEOGRAPHIC MARKETS Systematics operates 26 data centers for its 100 bank clients. The centers are distributed through the continental U.S.

COMPUTER HARDWARE AND SOFTWARE

- Systematics' operated sites are all IBM equipment based. Host computers are typically IBM System 370/135s 360/40s, and 360/145s.

- The network supports CRTs, manned and unmanned teller terminals, cash dispensers, point-of-sale terminals, audio response units, AT&T view sets, and other banking peripheral equipment. The computers are accessed by dial-up and leased lines.

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